

- 3 A magnetic recording medium according to claim 2 wherein the ratio of A/B is 1.3 or more.
- 4 A magnetic recording medium according to claim 2 wherein the protective film in the CSS area comprises a plurality of films, an amorphous carbon layer is present on the magnetic film in the CSS area and in the data area, said amorphous carbon layer being composed mainly of carbon, a combination of carbon and nitrogen, or a combination of carbon, nitrogen and hydrogen, and a diamond-like (DLC) layer is present on an uppermost protective layer in the CSS area, said diamond-like layer being mainly composed of carbon and hydrogen.
- 5 A magnetic recording medium according to claim 3 wherein the diamond like layer has a hardness of 15-19 GPa., and the amorphous layer has a hardness of 19 GPa. or more.
- 6 A magnetic disc apparatus using the magnetic recording medium according to claim 2.
- 7 A magnetic disc apparatus using the magnetic recording medium according to claim 3.
- 8 A magnetic disc apparatus using the magnetic recording medium according to claim 4.
- 9 A magnetic disc apparatus using the magnetic recording medium according to claim 5.
- 10 A magnetic disc apparatus using the magnetic recording medium according to claim 6.
- 11 A magnetic recording medium comprising a substrate, a magnetic film formed thereon and a protective film formed thereon for the protection of said magnetic film and composed mainly of carbon, wherein
said protective film comprises a boundary having a specific steepness between a ramp load area of thickness A and a data area of thickness B, and
 $|R_2 - R_1| < 5$, where R1 is a radial position at the end of the boundary in the direction of thickness decrease which corresponds to 90% of the thickness A and R2 is a

radial position at the end of the boundary in the direction of thickness increase which corresponds to 110% of the thickness B.

12 ~~13~~ 13. A magnetic recording medium according to claim ~~12~~¹¹ wherein the boundary has a rate of thickness change in the radial direction of 1.0 nm/mm or more.

13 ~~14~~ 14. A magnetic recording medium according to claim ~~12~~¹¹ wherein A/B ratio is 1.3 or more.

14 ~~15~~ 15. A magnetic recording medium according to claim ~~12~~¹¹ wherein the protective film in the ramp load area comprises a plurality of films, an amorphous carbon layer is present on the magnetic film in the ramp load area and in the data area, said amorphous carbon layer being composed mainly of carbon, a combination of carbon and nitrogen, or a combination of carbon, nitrogen and hydrogen, and a diamond-like (DLC) layer is present on an uppermost protective layer in the ramp load area, said diamond-like layer being mainly composed of carbon and hydrogen.

15 ~~16~~ 16. A magnetic recording medium according to claim ~~15~~¹⁴ wherein the diamond-like layer has a hardness of 15-19 GPa., and the amorphous layer has a hardness of 19 GPa. or more.

16 ~~17~~ 17. A magnetic disc apparatus using the magnetic recording medium according to claim ~~12~~¹¹.

17 ~~18~~ 18. A magnetic disc apparatus using the magnetic recording medium according to claim ~~18.12~~

18 ~~19~~ 19. A magnetic disc apparatus using the magnetic recording medium according to claim ~~14.13~~

19 ~~20~~ 20. A magnetic disc apparatus using the magnetic recording medium according to claim ~~18.14~~